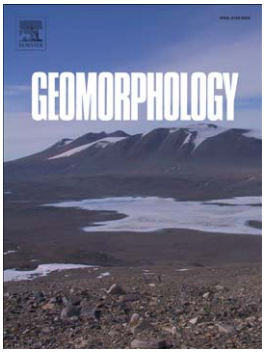


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# Coastal erosion and mass wasting along the Canadian Beaufort Sea based on annual airborne LiDAR elevation data

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## Abstract

Erosion of permafrost coasts has received increasing scientific attention since 1990s because of rapid land loss and the mobilisation potential of old organic carbon. The majority of permafrost coastal erosion studies are limited to time periods from a few years to decades. Most of these studies emphasize the spatial variability of coastal erosion, but the intensity of inter-annual variations, including intermediate coastal aggradation, remains poorly documented. We used repeat airborne Light Detection And Ranging (LiDAR) elevation data from 2012 and 2013 with 1 m horizontal resolution to study coastal erosion and accompanying mass-wasting processes in the hinterland. Study sites were selected to include different morphologies along the coast of the Yukon Coastal Plain and on Herschel Island. We studied elevation and volume changes and coastline movement and compared the results between geomorphic units. Results showed simple uniform coastal erosion from low coasts (up to 10 m height) and a highly diverse erosion pattern along coasts with higher backshore elevation. This variability was particularly pronounced in the case of active retrogressive thaw